Studies of Tiger Beetles. CXCIV. The Tiger Beetles (Coleoptera: Cicindelidae) from Wallacea and the region of Indo-Australian transitional zone: the present knowledge

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Abstract: The Wallacean fauna, i.e. (in this paper) the fauna from Sulawesi, the lesser Sunda islands (also known as Nusa Tenggara), the Moluccas, New Guinea, Palau Islands, the Solomons, as well as the northern part of Cape York peninsula in Australia, is briefly reviewed. Such a fauna, despite being somewhat impoverished in comparison with that of the Oriental region, is rather consistent, as it contains no less than 245 Tiger Beetle species, many of which are endemic to the area.

Key words: Wallacea, Tiger Beetles, Cicindelidae, analysis and discussion of the fauna.

Introduction

The Cicindelidae (Coleoptera) or Tiger Beetles, have a remarkable interest to the biogeographer because, in spite of their active and speedy flight, they are usually poor fliers, remaining faithful to their one small site, never wandering for more than a few dozen metres. Since most of them are strictly stenoecious, ecological barriers are very effective to them. Consequently endemic species are usually many, and moreover Tiger Beetles appear to be able to sometimes cross narrow sea stretches for instance by means of propagules (Cassola 1990 & 1998). As to the transitional area between the Oriental and the Australian biogeographical regions, usually better known as Wallacea, it certainly is of the greatest interest to the biogeographer as well to all naturalists.

While the eastern limits of Wallacea are usually found in Weber's line (which probably represents a major biogeographical boundary and the most effective faunal division between the Indo-Malayan and the Australian regions), its western limits are much more discussed instead (Gressitt 1959). In Huxley's and other authors' interpretation, Wallace's Line would pass west of the Philippines (thus including them in Wallacea), while in Mayr's interpretation (Mayr 1944) the Line leaves the Philippines on the west, thus excluding them from Wallacea. In this paper I would prefer to consider Wallacea and the Indo-Australian transitional zone as including just Sulawesi, the Lesser Sunda Islands (also known as Nusa Tenggara), New Guinea, the Moluccas, Palau Islands as well as the Solomon Islands, and moreover the northern part of Cape York peninsula in Australia. In contrast, other areas are to be excluded, such as the Philippines, the main Sunda Islands, Australian mainland, New Zealand, New Caledonia, and the other Pacific islands.

I myself had the opportunity of dealing several times with this area: Sulawesi (Cassola 1991; 1996; 1997; Cassola, Sawada 1994; Cassola, Brzoska 2008; Cassola, Wiesner 2001), New Guinea (Cassola 1987a; 1989; 2004; Cassola, Werner 1996a & b, 1998; 2001; Cassola, Matalin 2010; Matalin & Cassola in press), the Solomon Islands (Cassola 1987b), Palau Islands (Cassola, Satô 2004), the whole area (Cassola, 1990), and even the Fiji Islands in the Pacific Ocean, where two endemic species exist which are close relatives of New Guinean *Polyrhanis* (Cassola 1983; 1986; 2009). An overall assessment of western Wallacea was provided by Coates & Bishop (1997), while New Guinean geography and biogeography was reviewed by Gressitt (1982). New species from Wallacea and the Australo-Papuan region were also published by Brouerius van Nidek (1953; 1954a & b; 1959; 1960; 1968; 1973), Rivalier (1972), Schüle (1998; 2010), Werner (1990; 1992), Werner & Wiesner (1997; 1999), Wiesner (1994; 1999; 2000), Sawada & Wiesner (2000), Naviaux (2002), and Matalin & Wiesner (2008). Others are presently in press. Nomenclature follows Rivalier (1963; 1971).

Fauna and biogeography of tiber Beetles

The Tiger Beetle fauna of this large area is not probably yet fully known and may still even reserve new exciting discoveries to the dedicated student. Moreover, it appears to be somewhat impoverished, as no more than 245 species are presently known in all (including also unpublished information), two of which appear in need to be confirmed. These species belong to the following genera (most of which are better represented in the Oriental region or in Australia): the Collyrine genera *Neocollyris* (subgenus *Neocollyris*) W.Horn, 1901 (3 species out of 242) and *Tricondyla* Latreille, 1822 (7/47), as well the Cicindeline genera *Australicapitona* Sumlin, 1992 (2/10, both of which should be confirmed), *Dilatotarsa* Dokhtouroff, 1882 (2/8), *Heptodonta* Hope, 1838 (1/12), *Distipsidera* Westwood, 1837 (3/13), *Therates* Latreille, 1817 (16/108), and several genera which were previously thought to be part of genus *Cicindela* Linnaeus, 1758 (s. auct.): *Hipparidium* Jeannel, 1946 (2/21), *Calomera* Motschulsky, 1862 (18/45), *Lophyra* Motschulsky, 1859 (subgenus *Spilodia* Rivalier, 1961) (1/6), *Thopeutica (*subgenus *Thopeutica*) Schaum, 1861 (20/43), *Cylindera* Westwood, 1831 (subgenus *Ifasina* Jeannel, 1946) (8/78), *Myriochila* (subgenus *Myriochila*) Motschulsky, 1862 (7/26), *Abroscelis* Hope, 1838 (1/6) and *Enantiola* Rivalier, 1961 (2/4). Several species belong, in contrast, to genera which are endemic to the area: *Oxygoniola* W.Horn, 1892 (1), *Darlingtonica* Cassola, 1986 (1), *Caledonomorpha* W.Horn, 1897 (10), *Thopeutica* (subgenus *Pseudotherates* Cassola, 1991) (19), *Wallacedela* Cassola, 1991 (34), *Polyrhanis* Rivalier, 1963 (50), *Guineica* Rivalier, 1963 (2), *Orthocindela* Rivalier, 1972 (2), *Leptognatha* (subgenus *Leptognatha*) Rivalier, 1963 (23) and *Leptognatha* (subgenus *Thylacina* Rivalier, 1963) (10).

A better examination of the above mentioned genera would show the following. *Neocollyris* is a very speciose Oriental genus (245) species), distributed in continental Asia from Pakistan and India east to China, which enters the Wallacean area marginally only, with three species which inhabit Sulawesi and one which was recorded (most probably in error) from the Aru Islands. *Therates* is another speciose Oriental genus (108 species), which however occurs as well on Sulawesi (with 12 species), New Guinea (8 species), the Solomons (3 species), Misool (1 species) and Halmahera (2 species). Also *Tricondyla* is a mainly Oriental genus (47 species), recently reviewed by Naviaux (2002), which occurs with five species on Sulawesi and inhabits with 2 further species New Guinea, Halmahera, Cape York Peninsula and the Solomons. *Dilatotarsa* (8 species in all, primarily from Borneo and the Philippines) occurs with 2 species in Sulawesi (Cassola, Murray 1979). *Heptodonta* (12 species) is another Oriental genus that could well be extraneous to the area but it was doubtfully recorded (1 species) from Sulawesi (Cassola 1991). All other species belong, in contrast, to the formerly *Cicindela* L. (sensu auct.). *Thopeutica (Thopeutica)* is well represented in Sulawesi and the Philippines but is unknown elsewhere. *Hipparidium* (21 species) is an African and Malagasy genus which puzzlingly occurs with two species on Sulawesi too. *Calomera* (45 species, formerly better known as *Lophyridia*), *Lophyra (Spilodia)* (6), *Cylindera (Ifasina)* (78), *Myriochila (Myriochila)* (26), *Abroscelis* (6) and *Enantiola* (4) are also mainly Oriental genera which occur in the Wallacean area with one or few species only.

In contrast, *Australicapitona* is an Australian megacephaline genus (10 species), of which two species [*A. humeralis* (Macleay, 1863) and *A. bostockii* (Laporte de Castelnau, 1867) were recorded by W.Horn (1913) from Merauke in the Irian Jaya southern coast]. Although their occurrence in New Guinea is theoretically fully plausible, these species, as far as I know, have never been collected again and consequently these records appear in need to be confirmed. *Distipsidera* too is an E-Australian genus, with 13 tree-dweller species in all, two of which appear to be endemic to New Guinea.

The prothymine monospecific genera *Oxygoniola* and *Darlingtonica* are respectively endemic to Sulawesi and New Guinea. As to the genus *Caledonomorpha*, it is known so far to include 10 species which are all endemic to eastern New Guinea only (bird's tail, *i.e.* the Central, Northern, Morobe and Milne Bay provinces of Papua New Guinea) as well as to Fergusson and Goodenough Is. (D'Entrecasteaux Islands) in Milne Bay Province. As to the Cicindelina subtribe, while the typonominal subgenus of genus *Thopeutica* occurs, as it was stated above, both in Sulawesi (20 species) and the Philippines (23 species), its subgenus *Pseudotherates* is apparently a Sulawesi endemic, as well as genus *Wallacedela*, and they both form in fact the bulk of the Sulawesi fauna. In contrast, the genera *Polyrhanis* (50 species) and *Leptognatha* (s. l.) (33) are endemic to New Guinea and related area. The latter genus is hitherto practically known from main New Guinea only (with just one species occurring also on Yapen I.), while *Polyrhanis*, although centred on New Guinea itself (38 species) is also known from several small New Guinean islands: Roon (1), Waigeo (5), Misool (3), Yapen (4), Biak (1), Moluccas (Aru, Batjan, Halmahera, Buru and Ceram) (3), Goodenough (1), New Britain (2), Mioko (1), New Ireland (1) and the Solomon Islands (7 species). In Fiji there are two further species [*Oceanella vitiensis* (Blanchard, 1853) and *Parapolyrhanis oceanica* Cassola, 1983] which are apparently allied to *Polyrhanis* (Cassola 2009). As to *Guineica*, it is also a New Guinean endemic genus, with 2 species in the main island (1 of which occurs also in New Britain).

All in all, the Wallacean fauna, despite being somewhat impoverished, is rather consistent, with no less than 245 Tiger Beetle species, many of which are endemic to the area, known to occur in the considered area.

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Received: 01 March, 2011
Accepted: 15 April, 2011